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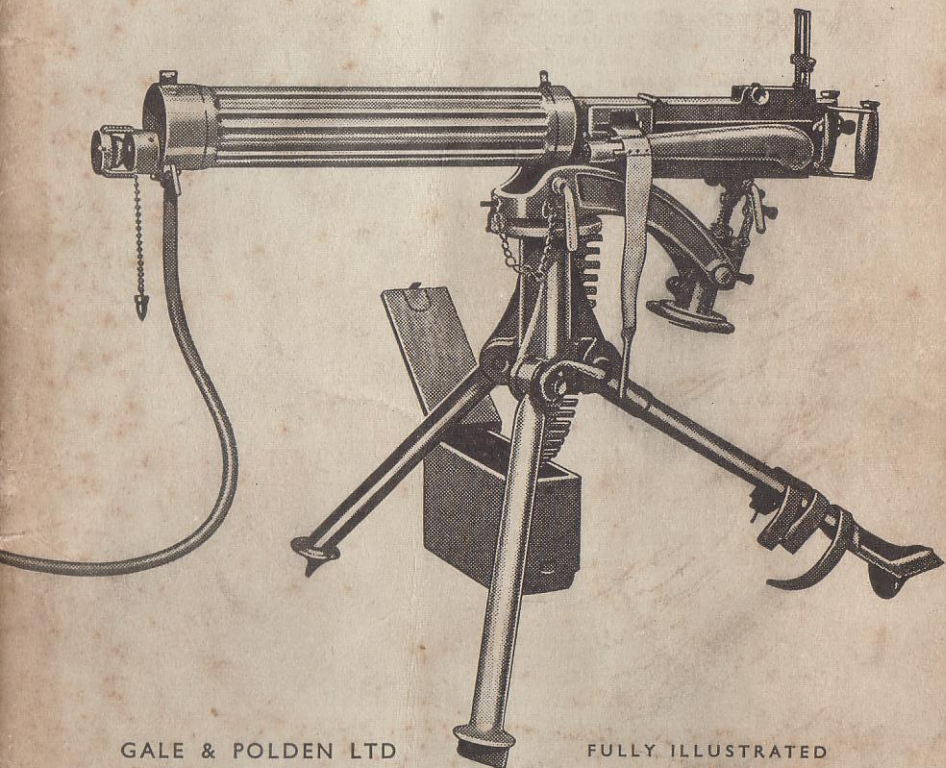
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THE VICKERS MACHINE GUN

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THE VICKERS MACHINE GUN MECHANISM MADE EASY

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Publishers' Foreword

This book is not meant to replace the official publications on the gun, but rather to be read in conjunction with them

This booklet on the Vickers Machine Gun was originally written for the Home Guard, and it describes and illustrates the .300 calibre gun, with which they are armed.

By studying this handbook with the gun by his side, so that the actual parts of the gun may be referred to as they are mentioned in the text, the reader will find that he will be able very quickly to grasp the names of all the various parts of the gun and the mechanism, and to strip and handle the gun and prepare it for firing in a surprisingly short time.

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THE VICKERS MACHINE GUN

GENERAL DESCRIPTION

PRINCIPLE OF OPERATION

The Vickers Machine Gun is recoil operated. It is fed by means of an ammunition belt. It is water cooled.

In recoil operation of automatic weapons, often the energy required to operate the mechanism is entirely furnished by the rearward force of the expanding gases of the exploding powder charge. In the Vickers Machine Gun the motive power given to the recoiling mechanism to drive it to the rear is derived partly in this manner and partly by the powder gases which after the exit of the bullet impinge on the front cone of the ball firing attachment and rebound violently against the front face of the muzzle cup.

At the moment the explosion takes place the breech is firmly locked against the base of the cartridge in the chamber. The first movement rearward of the recoiling portion of the gun unlocks the breech and the recoiling mechanism is free to move to the rear, and by means of various springs, cams and levers, the necessary mechanical operations are performed whereby the empty case is extracted and ejected, the succeeding live round is extracted from the ammunition feed belt and is fed into the chamber, the gun is cocked, the breech is locked and gun is ready to fire.

Once the gun has been loaded with a fully loaded ammunition belt and cocked by hand for the first round, the gun is entirely automatic and will continue to fire round after round so long as the thumb-piece is pressed, and will stop immediately the thumb-piece is released or there are no more rounds in the ammunition belt.

COOLING SYSTEM

The heat generated by the continuous firing of the gun is absorbed by the water contained in the water jacket which surrounds the barrel, thus the barrel is prevented from overheating.

TRIPOD MOUNTING

The gun is mounted on a tripod. The direction and elevation of the gun can be varied at will by the firer by means of the elevating and traversing mechanism and movements provided in the tripod mounting.

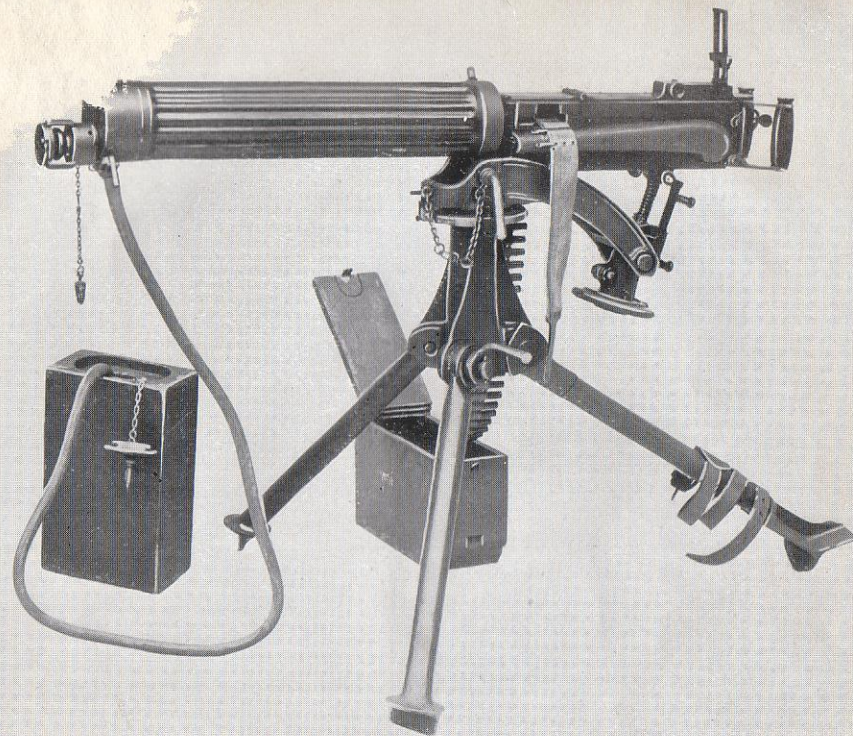


Plate I THE VICKERS MACHINE GUN

SIGHTS

A blade foresight is provided and a backsight adjustable for windage and elevation is fitted. (See also page 24.)

DATA

Weight of gun (water jacket empty)	...	33½ lbs.
Weight of gun (water jacket filled)	...	42 lbs.
Weight of ammunition belt (loaded 250 rounds MI ammunition)	...	14¾ lbs.
Weight of tripod	...	52 lbs.
Length of barrel	...	24½ ins.
Muzzle velocity, .303 Mark VII ammunition	...	2,440 ft. per sec.
Weight of bullet, .303 Mark VII ammunition	...	174 grains.
Muzzle velocity, .300 MI ammunition	...	2,700 ft. per sec.
Weight of bullet, .300 MI ammunition	...	150 grains.
Cyclic rate of fire (approx.)	...	500 rds. per min.

MECHANISM

The action of the mechanism will be the more easily followed and learnt if the gun is loaded with an ammunition belt filled with a number of dummy cartridges and the gun should be manipulated to demonstrate the various actions of the mechanism as described in the following text.

N.B.—In demonstrating the working of the mechanism with dummy cartridges, the function of the recoiling portions will be the more easily manipulated if the fuzee box and spring is removed. (See "Stripping," p. 14, para. 5.)

TO LOAD THE GUN

(1) Open the shutter. With the bullets of the dummy cartridges to the front, pass the tag end of the ammunition belt (loaded with dummy cartridges) through the feed block from the right. Grip the tag end of the belt protruding through the left side of the feed block with the left hand.

(2) Grasp the crank handle with the right hand and pull it on to the roller; and with it so held, the left hand grasping the tag end of the belt should give it a sharp pull to the left as far as it will go.

(3) Let go the crank handle. The first cartridge is now gripped between the upper and lower portions of the gib at the top of the extractor.

(4) By pulling the crank handle back on to the roller again, giving the belt another sharp pull to the left and letting the crank handle go forward again the first cartridge will be withdrawn from the ammunition belt and positioned in the chamber ready to be fired, and the succeeding round will be gripped by the gib in the upper part of the extractor.

The gun is now cocked and ready to fire.

FIRING THE GUN

(5) On raising the safety catch and pressing the thumb-piece of the firing lever, the firing lever pawl pushes the bottom end of the trigger bar lever forward. Thereby the head of the trigger bar lever moves to the rear which, being engaged with the trigger bar situated in the rear cover, draws the latter to the rear. The forward end of the trigger bar being in engagement with the trigger in the lock, the trigger moves to the rear, releasing the striker, which flies forward to explode the cap of the cartridge in the chamber.

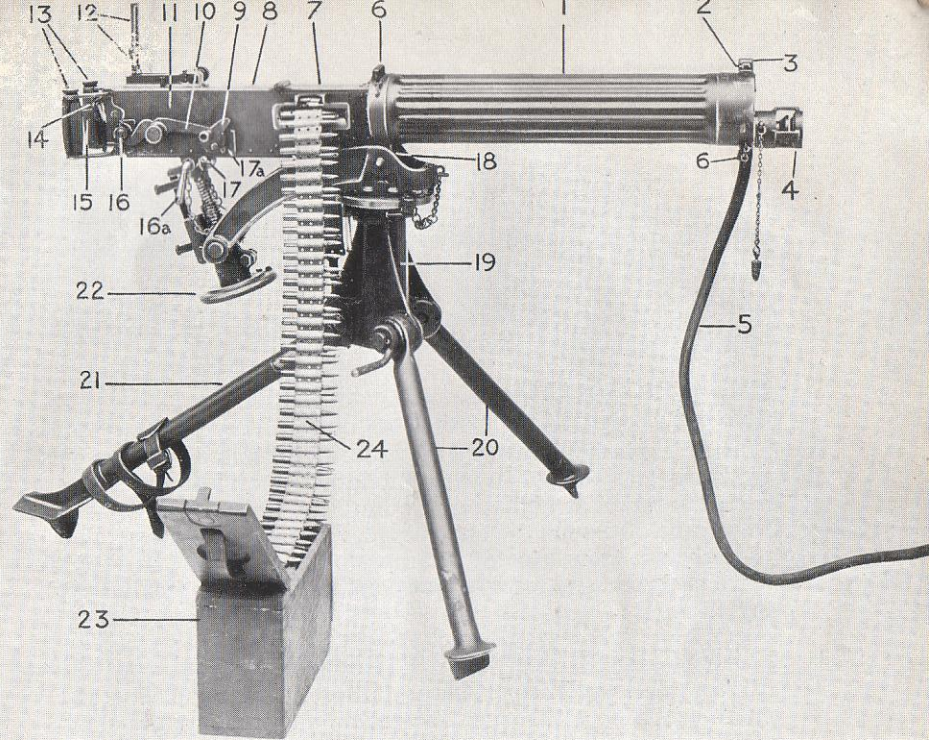


Plate II

- | | | | |
|----|----------------------|-----|-----------------------|
| 1 | Barrel casing. | 14 | Safety catch. |
| 2 | Foresight. | 15 | Thumb-piece. |
| 3 | Foresight protector. | 16 | Roller. |
| 4 | Muzzle attachment. | 16a | Elevating pin. |
| 5 | Condenser tube. | 17 | Shutter catch. |
| 6 | Screwed plugs. | 17a | Check lever bracket. |
| 7 | Front cover. | 18 | Crosshead. |
| 8 | Rear cover. | 19 | Socket (tripod). |
| 9 | Check lever. | 20 | Tripod front legs. |
| 10 | Crank handle. | 21 | Rear leg (tripod). |
| 11 | Breech casing. | 22 | Elevating hand wheel. |
| 12 | Backsight. | 23 | Ammunition box. |
| 13 | Traversing handles. | 24 | Ammunition belt. |

BACKWARD MOVEMENT OF THE MECHANISM

The backward movement of the mechanism provides the following functions :—

- (A) The spent case of the fired round in the chamber is extracted.
- (B) The succeeding live round is withdrawn from the ammunition belt and positioned ready to be loaded into the chamber on the next movement forward of the mechanism.
- (C) The striker is cocked.
- (D) The fuzee spring is extended ready to reassert itself to drive forward the recoiling mechanism again.

MUZZLE ATTACHMENT

Recoiling portions of the mechanism

(6) The explosion of the charge causes a backward pressure on the lock, and the gases which follow the exit of the bullet from the barrel at high pressure impinge violently against the front cone of the muzzle attachment, from which they rebound to strike the front face of the muzzle cup. These two forces drive the barrel and recoiling portions to the rear approximately one inch.

BACKWARD ROTATION OF THE CRANK

(7) This backward movement of the recoil causes the tail of the crank handle to roll against the roller, thus rotating the crank which causes the fuzee to wind the fuzee chain and extend the fuzee spring, at the same time driving the lock to the rear. The momentum imparted to the lock, crank and crank handle by the recoil causes the crank handle to continue to roll against the roller, which, together with the assistance of the pull imparted by the extended fuzee spring, forces the recoiling portions forward again with the exception of the lock, which continues its backward movement for a short distance before it joins in the forward movement.

ACTION OF THE FEED BLOCK

Top and bottom pawls

Withdrawing of succeeding round from ammunition belt

(8) During the backward movement of the mechanism the stud of the bottom lever of the feed block located in its recess in the prolongation of the left side plate is forced to the rear, carrying with it the bottom lever which, connected with the top lever, carries the latter to the right, which carries the slide to the

right. The top pawls are thus driven to the right and ride over and engage behind the succeeding cartridge in the belt, which is held in place by the bottom pawls.

THE LOCK

Extractor

Cover ramps

Gib

Side levers

Extraction of empty case

Positioning of succeeding round

(9) During the backward movement of the lock the extractor draws the live round from the belt and the empty case from the chamber. The horns of the extractor ride along the top of the solid cams in the sides of the breech casing, and when they clear the ends of these cams (the cartridge is now withdrawn clear of the belt) the ramps in the rear cover force the extractor downwards, bringing the cartridge into alignment with the chamber. As the extractor drops the empty case usually falls off; if it does not it will be forced off when the extractor rises on the lock going forward home, by striking the ejection seating in the barrel casing. The live cartridge is held in position in the extractor by the gib, the bottom projection of which prevents the cartridge from slipping down the extractor face.

COCKING ACTION OF THE LOCK

Lock spring

Trigger

Tumbler

Sear

(10) The backward rotation of the crank causes the connecting rod and side lever head to move upwards; the latter bearing on the tail of the tumbler rotates it, thus forcing the firing pin to the rear.

The long arm of the lock spring bears against the projection of the firing pin. The continued rotation of the tumbler on its axis withdraws the firing pin, thus compressing the lock spring until the nose of the trigger, actuated by the short arm of the lock spring, is forced over the bent of the tumbler. The firing pin is withdrawn still further back until the bent of the sear, actuated by the sear spring, springs into the bent of the firing pin, thus retaining it and preventing it from flying forward.

FORWARD MOVEMENT OF THE MECHANISM

The forward movement of the mechanism provides the following functions :—

- (A) The fuzee spring reasserts itself, thus driving the recoiling portions forward.
- (B) The succeeding live round is fed into the chamber, and the next round in the ammunition belt is positioned in the feed block and gripped by the extractor, ready to be withdrawn on the next rearward movement of the mechanism.
- (C) The breech is locked.
- (D) The trigger bar being engaged with the trigger, the gun is ready to fire on the thumb-piece being pressed.

THE FEED BLOCK

(11) During the forward movement of the mechanism the feed block mechanism is actuated by the stud of the bottom lever being in engagement by means of its stud in its recess in the prolongation of the left side plate. When the recoiling portions return forward to their original position the bottom lever of the feed block is thus moved forward, causing the top lever and slide to move to the left. The slide carries the top pawls to the left, which brings the next live round in the ammunition belt, behind which these pawls are engaged, into position against the cartridge stops, ready to be gripped by the extractor.

FORWARD ROTATION OF THE CRANK

Fuzee spring action

(12) When the force of the explosion has been expended, the fuzee spring, which has been extended during the backward movement of the mechanism, reasserts itself and through the fuzee chain and link rotates the crank in a forward direction, thereby the connecting rod and side lever head drives the lock forward.

FORWARD MOVEMENT OF THE LOCK

Extractor

Side lever

Gib

Insertion of live round into chamber

(13) The extractor carrying the live round, correctly positioned by the gib, feeds it into the chamber by the forward movement of the lock.

The side levers act on the extractor levers which raise the extractor. The gib releases its hold of the base of the live round as it is depressed against its spring and forced to recede into the face of the extractor.

The extractor grips the live round positioned in the feed block ; the gib springs forward to grip the base of this round to position it correctly in the extractor prior to its withdrawal on the next rearward movement of the lock.

Should there be no cartridge in the belt for the extractor to grip when it has reached its highest point, it would fall and the horns of the extractor would foul the solid cams in the breech casing on the commencement of the next backward movement of the lock. To prevent this, springs in the side plates are provided which engage in slots in the sides of the extractor and hold it in its highest position.

Sear

Firing pin

Trigger

Automatic fire

As the lock reaches its fully forward position the side lever head is forced by the connection rod slightly below the horizontal, when it depresses the sear, which disengages from the firing pin, allowing the firing pin to move forward slightly so that the nose of the trigger engages the bent in the tumbler.

In automatic fire the pressure on the thumb-piece is retained, thus the nose of the trigger is held clear of the bent of the tumbler and the firing pin will be free to spring forward under the compression of the lock spring, when the side lever head depresses the sear, thus firing the cartridge. The depression of the sear is timed so that the firing pin cannot be released until the lock has fully closed and is in the firing position.

The gun will continue to fire automatically in this way shot after shot until the pressure on the thumb-piece is released or there is no more ammunition in the belt.

TO UNLOAD THE GUN

Pull the crank handle on to the roller twice ; this clears the two cartridges on the face of extractor. Raise the finger plate of the bottom pawls at the same time depress the top pawls ; this frees the belt which can now be withdrawn.

MOVEMENTS OF THE LOCK ILLUSTRATED

The plates opposite serve to show clearly the movements of the lock. The internal mechanism has been taken out of the gun; the ammunition belt and fuze spring are omitted for clarity.

Plate 3 (top)

Plate 3 shows the lock fully forward home, having inserted the live round in the chamber.

The side lever head is in the horizontal position and is seen in contact with the sear, just prior to its finally moving slightly below the horizontal position when it depresses the sear, and presuming pressure on the thumb-piece is maintained, this would allow the striker to fly forward and fire the round in the chamber.

The side levers have acted upon the extractor levers which have raised the extractor to its highest position. The extractor in its movement upwards has gripped the succeeding round in the ammunition belt.

Plate 4 (centre)

Plate 4 clearly shows the lock in its rearmost position.

The backward rotation of the crank is completed, and the tumbler is shown cocked. The side lever head is raised, thus the side levers are disengaged from the extractor levers, thereby the extractor is free to take up its lowest position to allow the live cartridge, correctly positioned in the extractor by the gib, to be brought into alignment with the chamber.

The empty case shown in the illustration on the top of the extractor usually falls off when the extractor drops.

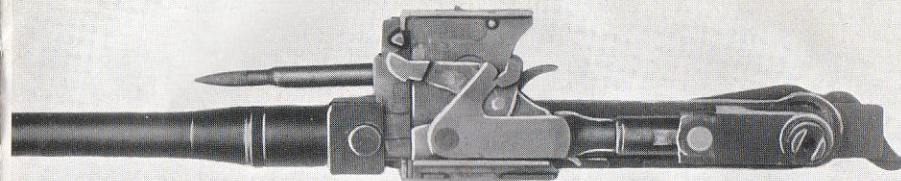
Plate 5 (bottom)

In Plate 5 the forward rotation of the crank is nearly completed.

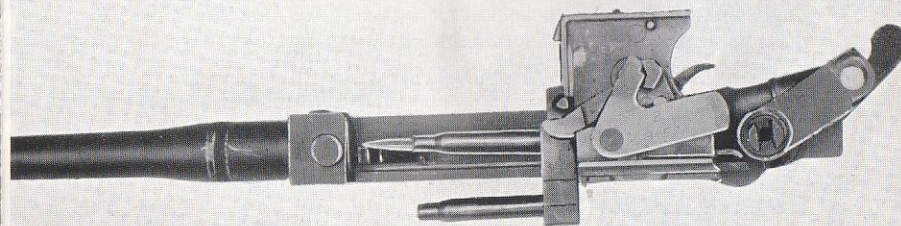
The side levers are in engagement with the extractor levers, which have just started raising the extractor.

The live cartridge shown in Plate 4 has been fed into the chamber, and the empty case of the previous fired round which has stuck on the extractor will be forced off when the extractor rises to its highest position.

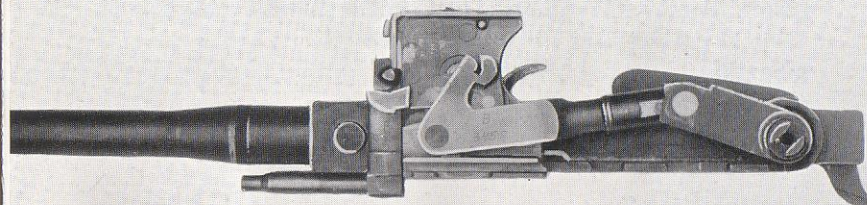
Tumbler is cocked. Sear is up as its bent has engaged with the firing pin bent.



3



4



5

STRIPPING

First ensure that the gun is unloaded, barrel casing empty, and the shutter open.

LOCK

- (1) Raise rear cover.
- (2) Pull crank handle on to roller, see that extractor drops.
- (3) Place a finger between extractor and extractor stop and lift lock; at the same time allow the crank handle to move forward slowly until the lock is released from the side plates. Lift lock clear and give the lock one-sixth of a turn and lift out. Lower crank handle on to check lever so that the connecting rod lies forward. Close rear cover.

FEED BLOCK

- (4) Raise the front cover and lift feed block out.

FUZEE SPRING AND BOX

- (5) With the left hand grasp the fuzee box near the front and push forward until the sockets on the fuzee box are clear of their retaining studs. Disconnect fuzee spring from fuzee chain. Remove fuzee box and spring.

FUZEE

- (6) Turn the fuzee until the lugs on the stem are free, withdraw fuzee and chain.

MUZZLE ATTACHMENT

- (7) Withdraw split pin and give outer casing one-sixth turn, when it can be removed. Unscrew and remove the muzzle cup, unscrew front cone (unscrew and remove gland and packing if necessary).

RECOILING PORTIONS

- (8) Raise rear cover. Unscrew and remove T fixing pin and lower the rear cross-piece. Remove the right and left slides. Draw out recoiling portions—i.e., side plates, crank and connecting rod and barrel. Disconnect the left side plate from the barrel. Remove the right side plate (together with crank handle, crank and connecting rod) from the barrel.

ROLLER

- (9) Remove split pin, collar and roller.
- Parts now stripped (1 to 9) from the gun are shown in Plate VI.

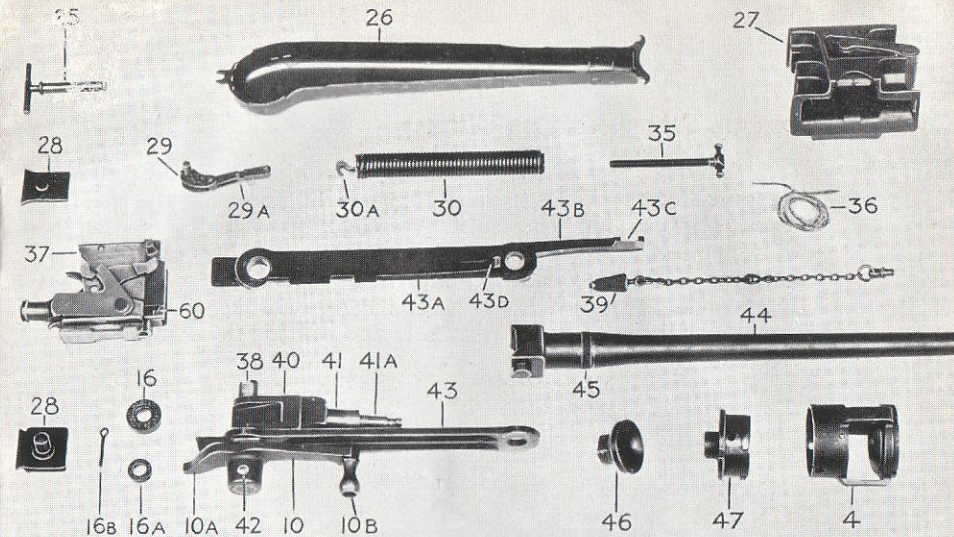


Plate VI

- | | | | |
|-----|-------------------------------|-----|----------------------------------------------|
| 4 | Muzzle attachment front cone. | 38 | Crank shaft. |
| 10 | Crank handle. | 39 | Cork plug. |
| 10A | Tail of crank handle. | 40 | Crank. |
| 10B | Knob of crank handle. | 41 | Connecting rod. |
| 16 | Roller. | 41A | Stem of connecting rod. |
| 16A | Roller collar. | 42 | Crank handle fixing pin screw. |
| 16B | Roller-retaining pin. | 43 | Right side plate. |
| 25 | Rear cross-piece T-pin. | 43A | Left side plate. |
| 26 | Fuzee spring box. | 43B | Prolongation of left side plate. |
| 27 | Feed block. | 43C | Recess in 43B for stud of bottom feed lever. |
| 28 | Right and left slides. | 43D | Left side plate spring for 60. |
| 29 | Fuzee. | 44 | Barrel. |
| 29A | Fuzee chain. | 45 | Cannellure in 44 for asbestos packing. |
| 30 | Fuzee spring. | 46 | Muzzle attachment cup. |
| 30A | Fuzee spring hook. | 47 | Muzzle gland. |
| 35 | Fuzee spring adjusting screw. | | |
| 36 | Asbestos string packing. | | |
| 37 | Lock. | | |

DETAIL STRIPPING

DETAIL STRIPPING THE LOCK

(10) The lock will be found to be cocked when removed from the gun, but check to see that it is cocked. Force out the side lever split pin and axis bush. Remove the side levers, the extractor levers and the extractor. Remove tumbler axis pin, remove tumbler. Depress sear, thus releasing lock spring. Remove trigger axis pin, when the trigger and lock spring can be removed. Press sear downwards and remove firing pin and sear and sear spring.

(11) To remove gib, push out gib spring cover, remove gib spring and gib.

All the parts of the lock as stripped and described above (10 and 11) are shown in Plate VII.

To reassemble the lock.

(12) Insert sear, spring downwards. Ensure that sear jaws engage sear pivot. Insert firing pin in its grooves. Insert tumbler and tumbler axis pin. Replace gib, its spring and cover in position and slide on extractor. Replace extractor levers, side levers, and insert bush and split pin. With sear depressed by side lever head, hold trigger back and press down tumbler. Insert lock spring, long arm towards extractor, and force downwards and home.

CAUTION.—The firing pin should never be released unless the extractor is up against the top stop, so as to ensure that upon release the striker is in alignment and protrudes through the striker hole in the extractor.

FEED BLOCK

(13) Force out the split pin which fixes the top and bottom levers together. Separate the top and bottom levers. Remove the slide, top pawls and spring. Draw out bottom pawl axis pin and remove bottom pawl and spring.

The feed block showing all the parts stripped as described above (12 and 13) is shown in Plate VIII, p. 19.

To reassemble the feed block reverse the above.

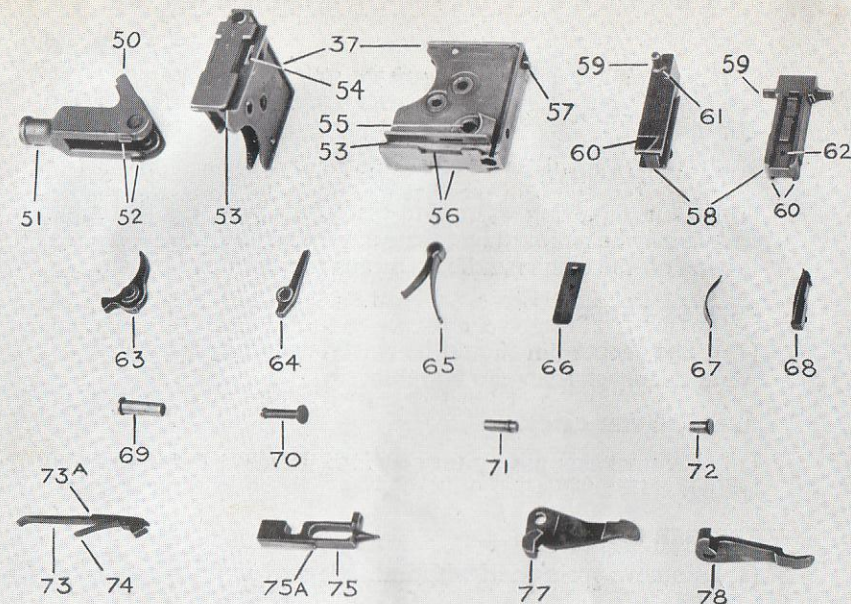


Plate VII LOCK STRIPPED, SHOWING PARTS

- | | | | |
|----|----------------------------------------------------|-----|---------------------------------------------|
| 37 | Lock casing. | 63 | Tumbler. |
| 50 | Side levers (pair). | 64 | Trigger. |
| 51 | Side lever head. | 65 | Lock spring. |
| 52 | Lugs on side levers for 54. | 66 | Gib spring cover. |
| 53 | Flanges of lock casing. | 67 | Gib spring. |
| 54 | Slots in lock casing for lugs on side levers (52). | 68 | Gib. |
| 55 | Bearing on lock casing for side levers (50). | 69 | Side levers axis bush. |
| 56 | Interruptions in flanges of lock casing. | 70 | Split-pin keeper for side levers axis bush. |
| 57 | Extractor stop of lock casing. | 71 | Tumbler axis pin. |
| 58 | Extractor. | 72 | Trigger axis pin. |
| 59 | Horns of extractor. | 73 | Sear. |
| 60 | Grooves in extractor for side plate springs. | 73A | Sear bent. |
| 61 | Shoulders of extractor for side lever (78). | 74 | Sear spring. |
| 62 | Hole in extractor for firing pin (75). | 75 | Firing pin. |
| | | 75A | Firing pin bent (to engage sear bent). |
| | | 77 | Bent of extractor lever for side levers. |
| | | 78 | Extractor lever (right). |

If necessary the following can be stripped; those operations marked by an asterisk (*) should only be performed by an armorer.

*CRANK HANDLE

(14) After removing right side plate (see 8 above) the crank handle may be removed by taking out the screwed fixing pin and driving off the crank handle by means of a drift and mallet.

*CHECK LEVER

(15) The keeper pin should be driven out from the underside, when the check lever can be removed.

REAR COVER LOCK

(16) Remove axis pin by unscrewing. Remove cover lock and spring.

TRIGGER BAR

(17) Remove spring and withdraw trigger bar.

*FRONT AND REAR COVER

(18) Remove the keeper pin and check nut and force out the joint pin.

*REAR CROSSPIECE

(19) Remove keeper pin and check nut and force out joint pin.

*FORESIGHT

(20) The correct zero position for the foresight should first be carefully marked so that it can be replaced in exactly the same position. The foresight is removed by driving it out of its dovetail groove in the foresight block. It should be driven out from left to right—i.e., driven through the right-hand opening in the foresight protector.

STEAM TUBE

(21) CAUTION.—This should not be removed if the valve is free. With the gun removed from the tripod, place the gun upright, muzzle up, so that gun will stand on the rear end of the breech casing. Remove the keeper screw and unscrew the steam tube.

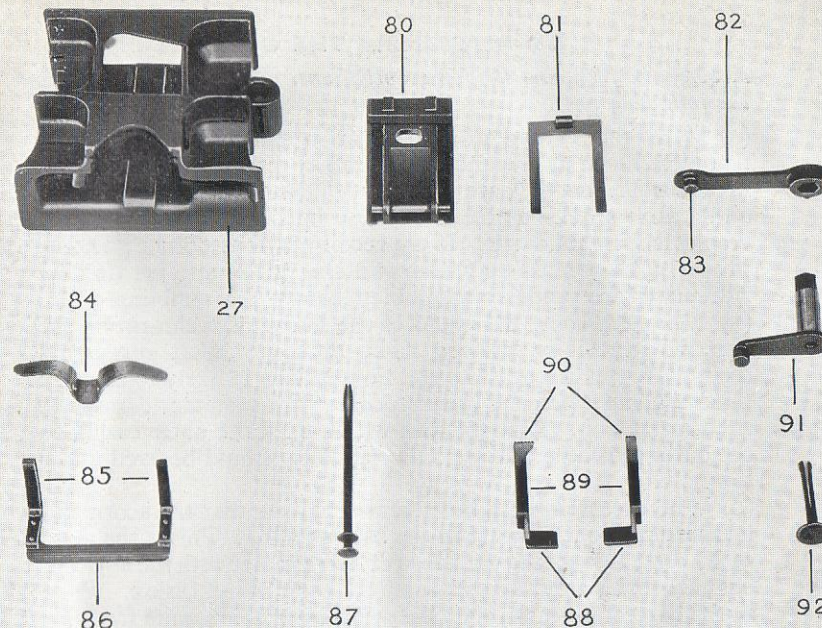


Plate VIII FEED BLOCK STRIPPED

- | | | | |
|----|--------------------------------------------|----|-------------------------------------------------------|
| 27 | Feed block. | 86 | Finger plate of bottom pawls. |
| 80 | Feed block slide. | 87 | Axis pin for bottom pawls. |
| 81 | Top pawls spring. | 88 | Top pawls thumb grips. |
| 82 | Top lever. | 89 | Top pawls (rear). |
| 83 | Stud of top lever for feed block slide 80. | 90 | Top pawls (front). |
| 84 | Bottom pawls spring. | 91 | Bottom lever. |
| 85 | Bottom pawls. | 92 | Split pin for fixing top and bottom feed block lever. |

TO REASSEMBLE THE GUN

Reverse the foregoing stripping operations. Pay particular care to the following :—

(A) With the cartridge guide slot uppermost (the cut in trunnion block at entrance to chamber) replace side plates and make certain that they are properly home on the barrel trunnions and crank shaft. Force must not be used as burrs on the crank shaft might occur. If the recoil portions do not go home properly, they must be withdrawn and checked to see that the side plates are properly assembled before reassembling again.

(B) When replacing the gland of the muzzle attachment on the gun, see that it is screwed right home to abutt gun barrel casing ; if this is not done the muzzle cup is likely to foul the muzzle gland when the barrel recoils, with resultant damage to the muzzle cup. The split pin which fixes the outer casing to the outer attachment of the muzzle gland should be fixed in the top hole.

(C) When reassembling the steam tube, see that the acorn end is inserted into its seating in the barrel casing. This is the more easily done by keeping the acorn end in contact with the adjacent channel formed by the corrugation of the barrel casing. When in the correct position, the tube will screw home quite freely.

SERVICING THE GUN—REPAIRS AND ADJUSTMENTS

There are certain repairs and adjustments which the gun will require from time to time and which gunners should be capable of carrying out by themselves.

CORRECT LENGTH OF CONNECTING ROD

It is important that the connecting rod should be of the correct length, as upon this depends the correct space between the face of the extractor and the base of the live round in the chamber.

Connecting Rod too Short

If the connecting rod is too short the space will be too great and the base of the cartridge will not be firmly supported on the explosion of round, which may result in a bulged or separated case.

Connecting Rod too Long

If the connecting rod is too long the lock will not go fully forward home ; the side lever head will therefore not depress the sear and the gun cannot fire.

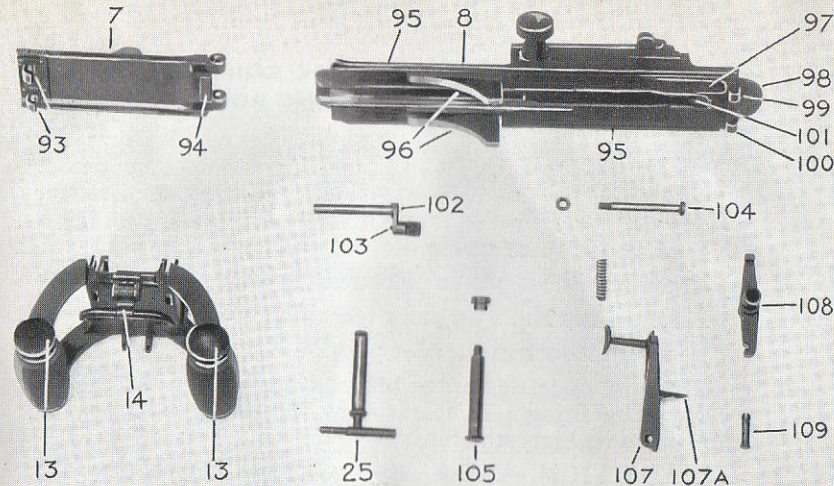


Plate IX

- | | | | |
|----|--------------------------------------------------|------|-------------------------------------|
| 7 | Front cover. | 99 | } Hooks of rear cover lock. |
| 8 | Rear cover. | 100 | |
| 13 | Rear cross-piece grips. | 101 | Trigger bar. |
| 14 | Safety catch. | 102 | Front cover catch. |
| 25 | Rear cross-piece T-pin. | 103 | Front cover catch plunger. |
| 93 | Hooks of front cover catch. | 104 | Joint covers screwed pin. |
| 94 | Extractor stop. | 105 | Rear cross-piece screwed joint pin. |
| 95 | Grooves in rear cover for ribs on breech casing. | 107 | Firing lever. |
| 96 | Rear cover ramps. | 107A | Firing lever pawl. |
| 97 | Rear cover lock spring. | 108 | Trigger bar lever. |
| 98 | Rear cover lock. | 109 | Safety catch axis pin. |

TO ADJUST AND CARRY OUT THE CORRECT ADJUSTMENTS OF THE CONNECTING ROD

To adjust and carry out the correct adjustments of the connecting rod, the following should be done :—

- (1) Remove the lock.
- (2) Remove the fuze spring.
- (3) Crank handle should be placed nearly vertical.
- (4) Place washer No. 1 on outer face of adjusting nut.
- (5) Replace the lock in the rear position.
- (6) From the underside of the breech case insert in the extractor over the firing pin hole a *live cartridge and raise the extractor to its highest point.

*CAUTION.—A live cartridge should only be used on the range or under conditions where it is possible for the muzzle of the gun to be pointed in the direction of safety, otherwise an armourer's gauge which is made for this purpose should be used.

- (7) See that the barrel is home and rotate the crank handle forwards, at the same time guiding the cartridge into the chamber.
- (8) If the connecting rod is the correct length a check will be felt (other than pressure necessary to depress the sear) as the crank handle reaches the check lever.
- (9) If no check is felt the connecting rod should be adjusted as follows :—

Washers of the No. 1 and No. 2 sizes, or both, as required to make the length correct should be placed on the outer face of the adjusting nut of the connecting rod.

When the correct length has been found in this manner, the washers must now be assembled permanently on the shoulder of the connecting rod and secured by its nut. To do this unscrew and remove the adjusting nut by means of the combination tool, place the washers on the connecting rod, and replace and screw up the adjusting nut tightly on to the washers.

Retest the connecting rod to ensure the adjustment has been carried out correctly.

CORRECT PACKING OF GLANDS

To renew or correct the packing of the glands, the following procedure should be carried out :—

Breech End Packing

Should water leak at the breech end, empty the barrel casing and withdraw the recoiling portions. A piece of asbestos string soaked in oil should be wound into the cannellure of the barrel. It should be pressed in with the point of a screw-driver or other sharp instrument until the cannellure is full.

The packing should now be oiled and smoothed down flush with the barrel. Reassemble the recoiling portions.

Muzzle Gland

Should water leak at the muzzle, stand the gun upright, remove muzzle attachment, muzzle cup, and unscrew the muzzle gland.

Remove the asbestos string packing, oil it and wind loosely around the barrel, and while so doing it should be pushed in with a No. 3 punch or piece of wood which will fit. Now screw on the gland as tightly as possible by hand.

The water leak should now be rectified and the recoiling portions should now move quite freely. To test this place the gun in a horizontal position, hang the lock and work the recoil portion backwards and forwards.

TO CHECK WEIGHT OF RECOILING PORTIONS

Remove fuze spring, place crank handle in nearly vertical position. Place loop of spring balance on crank shaft and pull slowly to rear. Weight should not exceed 4 lbs.

If excess weight is required to move the recoiling portions, it is caused by the packing pressing too hard on the barrel. The gland should be removed and one or two strands taken out of the asbestos. Retest recoiling portions for smooth working.

BROKEN LOCK SPRING

Any replacements of parts in the lock should be done in sequence as it is stripped. In the case of breakage of the lock spring, however, it being possible to shake out the broken portions clear of the lock, a new lock spring may be assembled without stripping the lock. See detailed Stripping of Lock and its reassembly, p. 16.

WEIGHING AND ADJUSTING FUZEE SPRING

See "Before Firing," p. 31 para. 3.

TO RENEW DISC ON MUZZLE ATTACHMENT

Unscrew front cone and remove old disc by cutting it and prizing up a piece which can be gripped by nose of a pair of pliers, and pull the old disc off. Place new disc in position, and tap it home on to front cone.

SIGHTS

FORESIGHT

A blade foresight is fitted at the top of the barrel casing ; it is dovetailed into the sight block, and is thereby adjustable laterally. It is provided with a tubular foresight protector.

BACKSIGHT

In Plate X is illustrated the backsight described in detail below. It is to be noted that guns may be fitted with different types of backsights to the one described. The description that follows should enable other types of backsights to be easily understood and used. It consists of a leaf. In its lowered position an open U backsight is in position, which is sighted for 500 metres. When leaf is raised graduations on the leaf are used by which the slide is set to the range required. For large variations in elevation the catch of the right side of the slide is depressed and the slide raised or lowered to range selected. For small and fine adjustments of elevation the elevating notched wheel at the top of the slide is used. The slide carries an adjustable plate containing five different-sized apertures so as to enable the gunner to select the one most suitable to the shooting conditions.

To set for the aperture required, push in with the tip of a finger on the serrated circle on the aperture plate and turn until the aperture required is at the bottom. Make sure aperture plate is correctly fixed by seeing that the corresponding notch on the periphery of the sight plate is engaged with the key at the top of the slide.

The aperture is set to the range marked on the leaf that coincides with the bottom face of the window (*e.g.* illustration shows aperture sight set for 1,200 metres). In addition to the aperture there is an open U backsight at the top of the slide. This open sight is set to the range marked on the leaf that coincides with the top edges of the shoulders of this sight (*e.g.*, illustration shows open adjustable backsight set for 1,550 metres). It will be noticed from the illustration that the grooves in the leaf in which the slide moves up and down incline to the left, so that as the slide is raised the aperture is automatically moved to the left. This movement is made to counteract the drift of the bullet.

The leaf sight is mounted on a base which is adjustable for windage : this adjustment is accomplished by means of the milled-head screw situated to the left of the sight base. This windage adjustment screw, when rotated forwards away from

Continued at foot of page 25

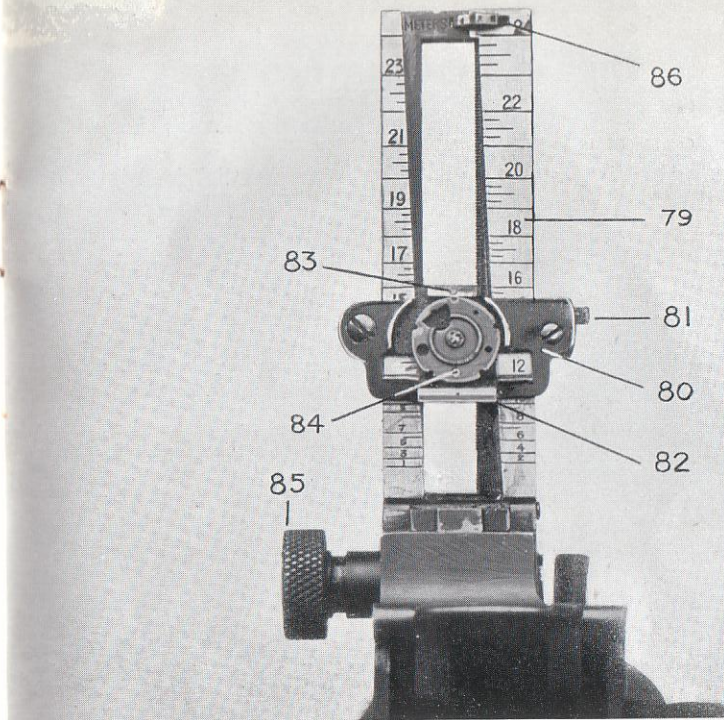


Plate X BACKSIGHT

- | | | | |
|----|-----------------------------------|----|-----------------------------------------|
| 79 | Graduated leaf. | 84 | Six-hole adjustable aperture eye-piece. |
| 80 | Adjustable backsight slide. | 85 | Windage adjustment screw. |
| 81 | Adjustable backsight slide catch. | 86 | Elevating fine adjustment screw. |
| 82 | Fixed open backsight. | | |
| 83 | Adjustable open backsight. | | |

gunner, moves sight to left to counteract for wind blowing from left to right, and when rotated backwards (*i.e.*, towards gunner) the sight is moved to the right to counteract wind blowing from the right.

THE TRIPOD MOUNTING

The tripod with the gun mounted in position is clearly shown in Plates I and II, pp. 5, 7.

The crosshead, elevating gear, socket, direction dial, jamming bolts and clutch plates are clearly shown in Plate XI.

When the gun is mounted on the tripod, the jamming handle of the rear leg should be adjusted so that the direction dial is horizontal.

ELEVATING GEAR

To elevate the gun, the hand wheel is turned anti-clockwise.

To depress the gun the hand wheel is moved in the opposite direction.

The text which follows under the headings "To Erect Tripod," "To Dismount Tripod," "To Mount Gun," should be read as notes on how to carry out these operations; they are not intended to convey the sequence of drill or the complete drill. The operations carried out by No. 1 and No. 2 of the gun team are specifically mentioned as they occur in these operations. The duties of other members of the gun team and the drill of the gun team are fully laid down in the official textbook covering this point.

TO ERECT TRIPOD

The tripod is placed on the ground, legs folded and to the rear, socket upright.

Place one leg either side of the legs, bend down and slacken off the jamming handles sufficiently to disengage clutch plates. Now grasp the arm of the crosshead close to the socket with both hands and raise the tripod the correct height. First let go the arm of the crosshead with the right hand, which should now do up the right front leg jamming handle, and similarly the left front leg jamming handle is tightened with the left hand, the right hand meanwhile grasping the arm of the crosshead.

The rear leg jamming handle is now clamped up tight, making certain that the socket is upright and so the direction dial will be horizontal.

Finally ensure that the tripod legs are firmly on the ground (the spade shoes should be stamped in) and all jamming handles are clamped up tight, the clutch plates being in correct engagement. The tripod should be the correct height for the firer in the sitting position. The rear leg should be in alignment with the target.

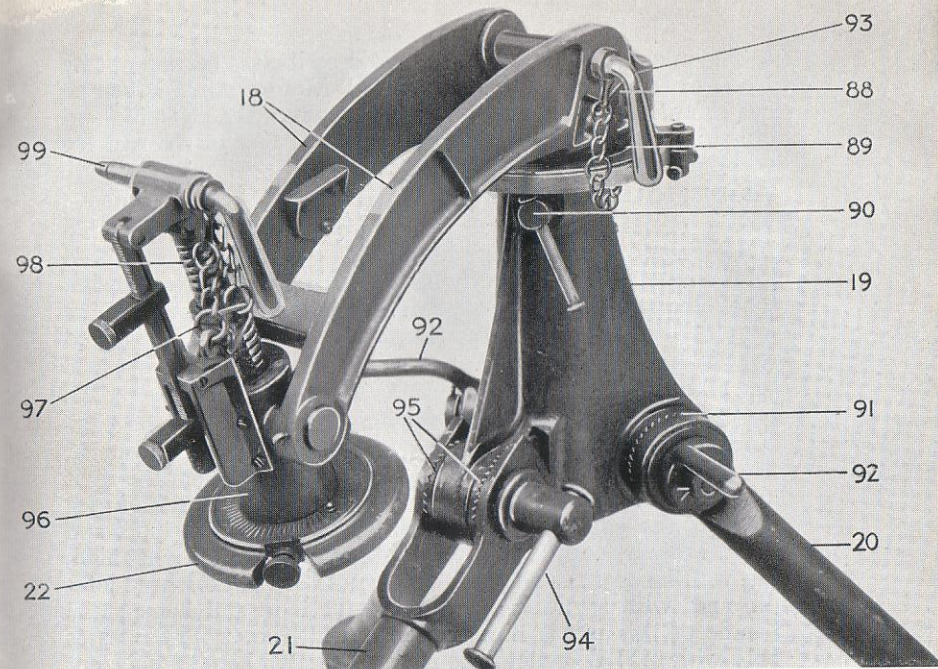


Plate XI TRIPOD

- | | | | |
|----|-----------------------------------------|----|---------------------------|
| 18 | Crosshead arm. | 91 | Front leg clutch plate. |
| 19 | Socket. | 92 | Front leg jamming handle. |
| 20 | Front leg. | 93 | Crosshead pin. |
| 21 | Rear leg. | 94 | Rear leg jamming handle. |
| 22 | Elevation dial and elevating handwheel. | 95 | Rear leg clutch plate. |
| 88 | Crosshead. | 96 | Elevating tumbler. |
| 89 | Direction dial. | 97 | Elevating pin chain. |
| 90 | Block jamming handle. | 98 | Elevating gear. |
| | | 99 | Elevating pin. |

The erection of the tripod above described is carried out by No. 1 of the gun team on command "Mount gun." When he has completed the above, he finally removes the elevating and crosshead joint pin and then sits down in rear of the rear leg with his legs either side of it.

TO DISMOUNT THE TRIPOD

No. 1 reverses the above procedure described under "To Erect Tripod." When completed, both elevating and crosshead joint pins should be correctly inserted and handle turned down. The legs should be correctly folded together and the jamming handles done up. No. 1 then lies down to the left of the tripod (or stands to attention).

TO MOUNT THE GUN

No. 2 mounts the gun in the following manner: First the shutter is opened. Pick up gun by grasping the right traversing handle with the left hand and the barrel casing under the right arm. By kneeling on the left knee and extending the right leg forward, the gun can be placed in position on the tripod, and No. 2 now, by supporting the barrel casing on the right thigh, can with his right hand grasp the handle of the crosshead joint pin and, with it turned upwards, drive it in and home; the handle of this pin is now turned down. No. 2 now releases hold with his left hand of the right traversing handle, pulls out the cork plug and affixes steam pipe and inserts its end in the condenser.

FIRING THE GUN

FIRING POSITION

With gun correctly mounted on tripod as previously described and the rear leg in alignment with the target, No. 1 should be seated on the ground in rear of the rear tripod leg, his legs either side of the rear tripod leg; feet inclined outwards, knees slightly drawn up so that, with the hands correctly grasping the traversing handle, the elbows can rest on the inside of the thighs.

With the gun at the correct height this position should be comfortable and free from strain and the eye should be on a level with the line of sight.

HOW TO HOLD THE TRAVERSING HANDLES OPERATING THE SAFETY CATCH AND THUMB-PIECE

The third and little fingers should be grasped round the traversing handles, the thumbs resting lightly on the thumb-piece, the second fingers behind the safety catch and the fore-fingers on top of the traversing handles.

KINDS OF FIRE

SEARCHING FIRE

Cultivate the ability to turn the elevating wheel so that the line of sight is displaced up or down as required 15 minutes for every turn.

TRAVERSING FIRE

Traversing the gun is accomplished by tapping the gun in the required direction as follows:—

To traverse gun and strike of bullets to right, the right hand releases its hold of the right traversing handle and the right hand is made to tap the right traversing handle (with the ball of the thumb, hand open) so that it is driven over to the left, thus the direction of the muzzle and therefore of the strike of the bullets is traversed to the right, and *vice versa* (left hand tapping left traversing handle) to traverse gun to left. A regular tap should be cultivated so that, together with the clamp adjusted to a nicety, each tap will move the line of sight 15 minutes. Note it is far preferable to employ a strong tap with the clamp tight than a weak tap with a loose clamp.

OBLIQUE TRAVERSING

Oblique traverse is carried out by combining traversing with an alteration of the elevating wheel.

It is of importance that the necessary actions to accomplish an oblique traverse are carried out in the correct sequence, *i.e.*:

(A) Fire—TAP—elevate (or depress).

(B) Tapping should be automatic as in ordinary traverse.

(C) When the gun is elevated or depressed, the sights should be used, as the amount of movement of the handwheel will depend upon the angle which the line to be traversed makes with the horizontal. Thus the greater this angle the larger amount of movement required by the handwheel. (Do not confuse this alteration of the elevating wheel with the regular 15-minute regular alteration employed in searching previously described.)

SWINGING TRAVERSE

The swinging traverse is only used at very close ranges against particular vulnerable targets needing a large amount of total traverse, when the normal method of traversing the gun would be too slow.

It is important that the crosshead should be kept upright.

Take up the normal firing position, both hands on the traversing handles. The body should be held fairly rigid and the gun traversed by moving the forearms and body, over to the left to traverse the gun to the right, and over to the right to traverse the gun to the left.

The rate of swing imparted to the gun in this manner is scarcely perceptible but rather felt as the gun vibrates. It should be such as to alter the line of sight at the target at a range of 25 yards by 3 feet for every 10 to 20 shots fired (approximately one and a half to two seconds' continuous fire).

As soon as the gun begins to move on to the target the thumb-piece should be pressed.

TO LAY THE GUN

On the target being indicated, No. 1 will tap the gun over until the correct direction is obtained, then elevate or depress the gun until the aim is correct.

ADJUST SIGHTS

See pages 24 and 25.

" FIRE "

On being given the signal or command to fire, No. 1 will press in the thumb-piece with his thumb (having raised the safety catch with the second finger) as far as it will go ; this should be done with a quick and even movement. The thumb-piece is released after the required number of rounds have been fired in the burst of continuous fire resulting, and again the thumb-piece is depressed for the next burst, and this is repeated as ordered. Normal bursts are from 10 to 20 rounds, or approximately two seconds.

" CEASE FIRE "

The pressure on the thumb-piece and safety catch will be at once released. Aim should be immediately checked and any faults found with same corrected.

EYES

When the gun is being fired, the eyes should be directed at the target the whole time. They should not be allowed to look at the thumb-piece when being pressed or the movements made by either hand when traversing.

FIRING

BEFORE FIRING

The following points should be attended to before firing :—

1. EXAMINE BARREL

2. OIL UP

All moving parts should be thoroughly well oiled with a good lubricating oil.

Pay particular attention to the following :—

The recoiling portions—bearing parts of the barrel, side plates, lock guides on the side plates, all working parts of the lock, extractor guides and levers and bearings of the crank, connecting rod and side levers. Recess in prolongation of left side plate.

Covers—extractor stop in front cover, extractor ramps, trigger bar, cover catch and lock guides in rear cover.

Feed Block—bottom lever stud, top lever stud, slide.

Fuzee and chain.

Check lever.

3. WEIGH FUZEE SPRING

Check weight of fuzee spring as follows : Take out lock. Loop spring balance over crank handle and press down check lever. Weight indicated when crank handle begins to move, 7 to 9 lbs. Adjust by means of vice pin. Six clicks make difference of 1 lb. Clockwise increases, anti-clockwise decreases.

4. TEST FOR SMOOTH AND CORRECT WORKING OF MECHANISM

The recoiling portions should be checked to see that they work freely. To test this, remove the fuzee box and chain, turn the crank handle to the vertical position, and with it so held move the recoiling parts backwards and forwards. They should work freely and the barrel should go thoroughly home in its forward position. The weight necessary to move the recoiling portions should not exceed 4 lbs. Replace fuzee spring. Rotate the crank handle two or three times, and check to see that the mechanism is functioning correctly. Raise safety catch and press thumb-piece to ensure correct functioning of the firing mechanism. Ensure correct functioning of feed block. The muzzle cup should be quite dry and firmly screwed on. Thoroughly dry the bore and muzzle attachment.

5. PACKING GLANDS

The front and rear packing glands should make a watertight fit with the barrel and muzzle gland and the barrel and the trunnion block respectively, and at the same time allow the barrel to reciprocate smoothly on the forward and backward movement of the recoiling portions.

6. WATER SUPPLY

Fill the barrel casing with water by removing the screw filler plug at the rear end and removing the cork steam plug at the front end of the casing.

With the casing filled with water there should be no water leaks at the front packing gland or the trunnion block where the barrel protrudes; the latter point can be observed by removing the feed block.

Attach condenser tube and insert free end in condenser.

7. SUPPLY OF OIL IN HANDLE

Unscrew the milled heads (to which oiling brushes are attached) on the traversing handles, and see that the latter are filled with oil.

NOTE.—Re 4, 5, 6 above refer to pp. 22 and 23 for correct adjustment.

DURING FIRING

The following points should be attended to during firing :—

1. WATER SUPPLY

The barrel casing should be kept well supplied with water so that the barrel is always covered. (See p. 35, for data re water consumption.)

2. DO NOT PULL BELT

The ammunition belt should never be pulled when the gun is firing.

3. OIL MECHANISM

Every opportunity should be taken to see that mechanism is kept well oiled.

4. REFILL AMMUNITION BELTS

Empty or partly used ammunition belts should be refilled without delay.

5. TRIPOD

Watch tripod mounting for rigidity and tightness of clamps.

6. BELT FEED

Keep belt always in line with feed block, and if possible the ammunition box should be kept up to but not above the cross-head joint pin.

7. DURING TEMPORARY CESSATION OF FIRE

Take the opportunity to :—

- (A) Change partly used ammunition belt for full one.
- (B) Oil mechanism.
- (C) Check tripod mounting for rigidity; see that clamps have not worked loose and are quite tight.
- (D) See that muzzle cup is tight.

AFTER FIRING

The following points should be attended to after firing —

- (1) Unload gun.
- (2) Oil chamber, bore and muzzle cup attachment immediately upon cessation of firing.
- (3) Release lock spring.
- (4) Collect any live cartridges that may be amongst the empty cases.
- (5) On return to quarters—
 - (A) Drain casing of water.
 - (B) Remove barrel, clean outside and grease before reassembling.
 - (C) Thoroughly clean *bore of barrel, using hot water, 4 × 2, and oil in the approved manner as for a rifle, preferably using a cleaning rod; leave bore thoroughly well oiled.
 - (D) Examine all parts, thoroughly clean and oil.
 - (E) Examine ammunition belts, which should be cleaned if dirty. Hang up to dry if damp. Repair if torn.
 - (F) Clean tripod and oil working parts.

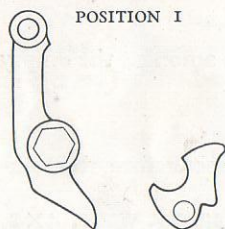
*NOTE.—The bore of the barrel is usually cleaned from the muzzle end, when assembled in the gun. To do this, first remove the lock in order that the face of the extractor cannot get damaged by the end of the cleaning rod being driven against it. Remove muzzle attachment and muzzle cup (which can now be cleaned also and should be left oiled). With flannelette on the jag, the cleaning rod may be inserted in the muzzle, placing the movable bush on the muzzle, and the rod worked up and down the bore. (If no movable bush is available, take care to avoid muzzle wear, or the bore may be cleaned from the breech end. When the barrel is removed for carrying out (C) above, it is then best to pour hot water down the bore prior to carrying out the above. Alternatively, a funnel may be used and inserted at the breech end.)

IMMEDIATE ACTION

On the Vickers gun (or any other gun for that matter) never think in terms of "stoppages." If the gun is properly looked after by the "No. 1" and the points before, during and after firing attended to, "stoppages" will seldom occur.

It is IMMEDIATE ACTION which must be studied. *Learn it as a drill* so that it can be applied instinctively and at once should the gun stop firing or fail to fire. The great majority of the causes which call for immediate action are preventable if the gun is "serviced" with care. When the Vickers gun is firing the crank handle is moving backwards and forwards and rotating continuously. It is the position in which the crank handle stops that indicates to the gunner the kind of immediate action to be applied. In daylight the position can at once be seen, and at night the position in which it has stopped can be felt with a touch of the hand.

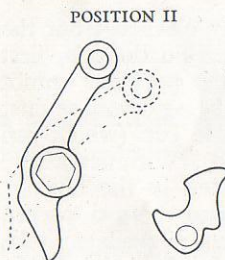
Immediate action, in a slightly different form in each case, must be applied if the crank handle stops in any of four positions shown in the illustrations.



POSITION I

IMMEDIATE ACTION to be taken to rectify the stoppage that has occurred as indicated by the crank handle in Position I. Pull the crank handle on to the roller, give the belt a sharp tug to the left, let go crank handle, relay and carry on firing. If after firing, stoppage recurs, with the crank handle in the same position, carry out the Immediate Action again and lighten fuzee spring by half a pound. Relay and carry on firing.

NOTE.—Keep the gun free of excessive friction and grit; see that the pockets in the belt are not too tight, that the glands are properly packed, and that the weight of the fuzee spring is set at the gun's "pet" weight. If this is done failure in the first position will not occur unless the cause is due to faulty ammunition and consequent weak explosion, a rare occurrence.



POSITION II

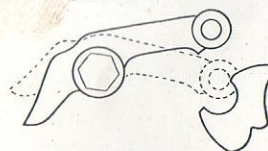
IMMEDIATE ACTION to be taken to rectify the stoppage that has occurred as indicated by the crank handle in Position II. Pull the crank handle on to the Roller, lift up the rear cover and raise the lock. Examine the cartridge on the face of the extractor. If it is a damaged cartridge or an undamaged cartridge with the front portion of a separated case adhering to it, clear the face of the extractor, reload, relay and carry on firing. If it is not a damaged cartridge or if the front portion of a separated case is not adhering to an undamaged cartridge, call for clearing plug. Insert this

into the breech, extract the front portion of the separated case which is causing the obstruction, reload, relay and carry on firing.

NOTE.—If care is taken when the belt is filled to see that damaged

cartridges are not inserted, and if the connecting rod is adjusted to the correct length, failure in the second position will not occur.

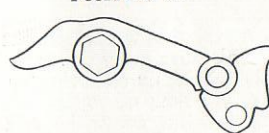
POSITION III



does not go down, glance at or feel the feed block slide. If the slide is wedged pull the crank handle on to the roller ("No. 2" may have to assist by opening the front cover and forcing down the horns of the extractor) and hold it there. "No. 2" must lift up the feed block sufficiently to allow the recoiling portions to go home, release the pawls and withdraw the belt enough to allow the uneven cartridges to be rectified and the belt straightened. Replace feed block, close and lock front cover, give the belt a sharp tug to the left, let go crank handle, relay the gun and carry on firing. If the slide is free "No. 2" must open the front cover, force down the horns of the extractor and at the same time "No. 1" must pull the crank handle on to the roller. "No. 2" will remove the first cartridge in the belt, and "No. 1" will change the lock, reload, relay and carry on firing.

NOTE.—See that the belts are evenly filled and are up and in line with the feed block; that the pockets are not worn or loose; that no thick-rimmed cartridges are inserted in the belt and failure in the third position will not occur unless the cause is due to a faulty or broken extractor.

POSITION IV



IMMEDIATE ACTION to be taken to rectify the stoppage that has occurred as indicated by the crank handle in Position IV.

Pull the crank handle on to the roller, give the belt a sharp tug to the left, let go crank handle, relay and carry on firing. If gun fails to fire, repeat. If gun still fails to fire, pull the crank handle on to the roller twice, change the lock, reload, relay and carry on firing.

NOTE.—Except for an empty pocket in the belt, failure in the fourth position will not occur unless the cause is due to defective ammunition or a broken or faulty part of the lock.

REMEMBER, Immediate Action is not completed until the gun has been relaid on the target and the thumb-piece pressed.

DISTINGUISHING MARKS

To distinguish it from the .303 calibre gun all .300 calibre Vickers guns should have the following parts painted red: Front body cover (2 in. band), mouth of feed block, side lever head.

USEFUL NOTES

CONSERVATION OF WATER

On active service replenishments of water supplies are sometimes either unavailable or there is no time for them to be brought up to gun position.

In order to conserve water and save time, the following procedure can be adopted when it is necessary to withdraw the recoiling portions and barrel from the gun for reasons such as replacements, faulty or broken parts, adjustments or examination.

Ensure gun is unloaded.

(1) No. 2 of the gun team removes from gun the muzzle attachment and unscrews muzzle cup from barrel.

(2) A plug should be previously prepared the size of the barrel at the muzzle end and of a length that will effectively seal the muzzle gland on the barrel being withdrawn. A temporary plug can be quickly prepared by using a spent cartridge case wrapped round with flannelette.

(3) No. 2 places this plug against the muzzle of the barrel and, when the barrel is withdrawn by No. 1, follows the barrel with the plug so that, as the barrel recedes from the muzzle gland, the plug effectively seals the gland.

While all the above operations are being carried out by No. 2, No. 1 removes the elevating pin and depresses gun. (No. 2 holds the gun thus depressed at an angle which will ensure that no water will flow out of the rear of the barrel casing through the trunnion block when the barrel is withdrawn.)

When the necessary replacements of parts, repairs or examination have been undertaken by No. 1, he reassembles the gun, and as the barrel is pushed forward home it pushes out the plug in the muzzle gland. No. 2 now reassembles muzzle cup and muzzle attachment. When the barrel is replaced it is advisable to plug muzzle with piece of flannelette to prevent water running down bore.

Finally, when gun is reassembled, the piece of flannelette plugging muzzle should of course be removed; and to ensure bore being clean, no water or obstruction being left, flannelette patch should be run through the bore on the cleaning rod.

During these operations No. 2 should take care that hot water does not reach his hands, as it may be quite hot enough to cause nasty scalds.

If there is time to drain the water jacket, this is done by removing the filler plug to allow air to enter, thus accelerating flow of water, and removing the drain plug and allowing water to flow into condenser can.

CONVERSION TABLE

METRES INTO YARDS		YARDS INTO METRES	
2,000 metres	= 2,200 yards	2,000 yards	= 1,800 metres
1,000 "	= 1,100 "	1,000 "	= 900 "
750 "	= 825 "	750 "	= 675 "
500 "	= 550 "	500 "	= 450 "
200 "	= 220 "	200 "	= 180 "

WATER CONSUMPTION

Water boils after firing approximately 500 rounds continuously.

Water evaporates at the rate of about 1½ pints per 500 rounds fired continuously.

After firing approximately 2,000 rounds the barrel casing will require refilling.

The gun may be fired up to 1,000 rounds (in special circumstances) without water in the jacket.

LOG BOOK

It is very important that a log book be kept for each gun, recording its details, number of rounds fired, etc. Details of such a book will be found on page 2 of cover.

BOOKS SPECIALLY RECOMMENDED

	s. d.
Elementary Drill Memory Card for Squad Commanders. Gives in concise form action to be taken by a Squad Commander on commands being given by Company or Platoon Commanders	0 6
By Post	0 7
CONTENTS.—Forming Up—Action of Markers—Falling In—Dressing—Squad Drill Movements—When to give words of command.	
Drill in Threes and Elementary Drill	1 3
By Post	1 6
General Instructions for Drilling Recruits—Squad Drill Without Arms—Squad Drill With Arms—Platoon and Company Drill.	
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Company Drill Movements and Commands in a nutshell. Folder form 6d. Sheet form 6d.	0 7
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